

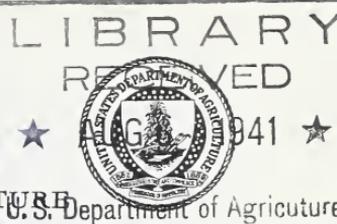
## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



June 1941 • Washington, D. C.

UNITED STATES DEPARTMENT OF AGRICULTURE



# The Pan America Tomato, A New Red Variety Highly Resistant to Fusarium Wilt

By WILLIAM S. PORTE, *associate pathologist*, and H. B. WALKER, *under scientific helper*, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry

## CONTENTS

	Page		Page
Origin and development.....	1	Season and adaptability.....	3
Characterization.....	2	Name.....	6
Productivity.....	3	Source of seed.....	6

## ORIGIN AND DEVELOPMENT

The Pan America tomato was developed from a cross between Marglobe and a wild Peruvian Red Currant selection possessing very high resistance to tomato wilt, which is caused by a widely distributed soil fungus, *Fusarium bulbigenum* var. *lycopersici* (Brushi) Wr. and R.

The maternal parent of the new tomato is Marglobe, a scarlet-fruited variety, introduced by the United States Department of Agriculture in 1925 and now widely used for canning and marketing fresh. Marglobe was chosen as a parent in the breeding work from which the new Pan America tomato was developed because of its several desirable horticultural characters, its resistance to nailhead rust, and its intermediate resistance to fusarium wilt. Moreover, it develops a vigorous vine growth and produces a heavy yield of fruit of medium-large size (6 to 7 ounces), high in solids, and of superior culinary quality. As it thrives under a rather wide range of environmental conditions, it is adapted to many different localities.

The paternal parent of the Pan America tomato is a wild small-fruited species, *Lycopersicon pimpinellifolium* (Jusl.) Mill., known as the Red Currant tomato. This particular introduction, P. I. 79532,<sup>1</sup> was found growing wild on the Pacific coast of Peru, South America, and was collected by G. N. Wolcott near Trujillo. Lines selected from this introduction have been almost entirely free from fusarium wilt, although tested in field and greenhouse against a number of virulent strains of the fusarium wilt fungus for about 10 years.

Under favorable cultural conditions this Red Currant tomato produces a medium-large, vigorous vine that continues growth until killed by frost. The leaves are rather small but very numerous and

<sup>1</sup> Originally called *Lycopersicon esculentum*.

have some tolerance to foliage blights, so that usually there is abundant green foliage at the end of the growing season. Unstaked and unpruned plants set 5 feet apart each commonly produce over 2,000 fruits, borne in clusters (racemes) of 6 to 12. The fruits are red, globular, resembling large currants about one-fourth to three-eighths of an inch in diameter. They are thin-walled, usually two-celled, and filled with greenish watery pulp and numerous small straw-colored seeds.

The first-generation hybrid had globular red fruits that averaged about an inch in diameter. The size of the progeny of the new hybrid was increased by successively backcrossing three times to



FIGURE 1.—Plant of Pan America tomato just before first harvest. The squares on the background are 1 by 1 foot. United States Horticultural Station, Beltsville, Md.

inbred Marglobe lines. Each backcrossed generation and the five subsequent generations of line selections have been tested either in the field or in the greenhouse for resistance to virulent strains of the tomato wilt fungus. In all tests of Pan America's parent lines selected in 1938 and later, 95 to 100 percent of the plant population samples tested have been entirely free from any evidence of fusarium wilt. In the course of the whole series of tests, a total population of 10,021 plants have been tested.

## CHARACTERIZATION

The Pan America tomato has the general vine, foliage, and fruit type of Marglobe<sup>2</sup> and is indeterminate in growth habit (fig. 1). The vine is slightly more decumbent and the leaves a little smaller than

<sup>2</sup> BOSWELL, V. R., et al. DESCRIPTIONS OF TYPES OF PRINCIPAL AMERICAN VARIETIES OF TOMATOES. U. S. Dept. Agr. Misc. Pub. 160: 23 pp., illus. 1933.

typical ones of Marglobe. However, the foliage is sufficiently dense, under good cultural conditions, to shade the fruit during development. The upper leaf surfaces are medium dark green or Lincoln Green (23 J 4 to 24 L 2),<sup>3</sup> and the lower leaf surfaces are of a dark yellow green or Mignon Green (21 J 6 to 22 H 5). The leaflets are medium large, and their marginal contours are similar to those of the Marglobe. The flowers are simple and have nonprotruding pistils. They occur in clusters of three to eight, and two to five fruits set on each cluster.

Immature fruits are pale green with the darker green about the stem end disappearing before ripening. The mature fruits are globular to deep oblate in shape, the polar depth of some fruits being equal to the equatorial diameter (fig. 2). The average diameter of 90 run-of-the-field ripe fruits was 7.4 cm., and the polar depth was 6.4 cm., or 86 percent of the diameter. The average weight was 199 gm. (7 ounces). The fruits are a bright scarlet (1 I 12 to 1 K 12) when ripe, approaching Toreador Dutch Vermilion color (2 K 12) under conditions favorable for red pigment development. The interior color is scarlet red to Blood Red (3 I 11 to 3 L 11). The solid central fleshy interior develops red pigment ahead of the periphery cells of the outer walls. The outer and inner walls are thick to very thick (0.45 to 1.18 cm.). The seed locules are usually small, somewhat irregular in shape and arrangement, and well filled with pulp, and they range from 4 to 12 in number with an average of 7 or 8 (fig. 3).

## PRODUCTIVITY

A number of single-plant selections from the early 1940 greenhouse tests at the United States Horticultural Station, Beltsville, Md., were grown in isolated field plots for observation and seed increase in the summer of 1940. The most promising of these single-plant selections appears to be 40W62, which was released as the Pan America tomato in the fall of 1940. A  $\frac{1}{10}$ -acre plot consisting of 168 plants planted 5 feet apart on light sandy loam soil in 1940 yielded over a ton of ripe marketable fruit. The plants produced a good uniform set of tomatoes of excellent shape and quality without any irrigation during a dry season. No organic manure had been applied on this soil for several years. Commercial 5-8-5 fertilizer was drilled into the soil at the rate of 1,000 pounds per acre a few days before the plants were set, and no later fertilizer applications were made.

## SEASON AND ADAPTABILITY

In season the Pan America tomato is a few days to a week earlier than Marglobe, or about 67 to 75 days to first commercial harvest from transplanting medium-sized plants that have not yet reached flowering stage. It appears suitable for canning, for the manufacture of tomato products, and for marketing fresh. It should be particularly useful in those regions having soils heavily infested with the fusarium wilt fungus, because it is much more resistant to tomato wilt than any commercial variety yet tested.

<sup>3</sup> MAERZ, A., and PAUL, M. REA. A DICTIONARY OF COLOR. 207 pp., illus. New York and London, 1930.

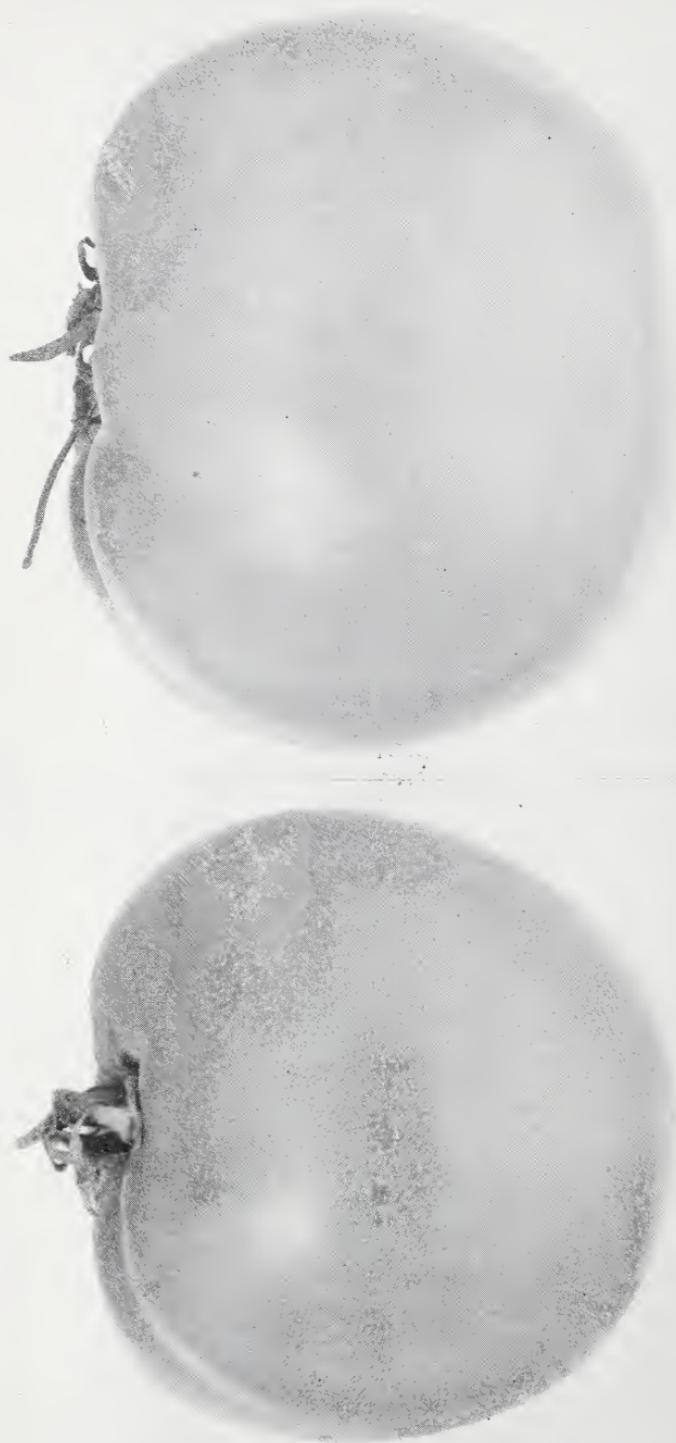


FIGURE 2.—Range in fruit shapes of Pan American tomato. At left, early globular specimen (more typical for the variety). At right, very large fruit. Such fruit tends to be relatively less deep. (Natural size.)



FIGURE 3.—Differences in interior structure of fruits of Pan America tomato. (Natural size.)

## NAME

It seems appropriate to name the new variety Pan America, not only because both North and South American countries contributed to its parentage but also because it symbolizes the interdependence, the complementary characters, and the intimate association of the countries of the Americas.

## SOURCE OF SEED

The United States Department of Agriculture has no seed of this or other varieties for general distribution or for sale. Seed of Pan America has been distributed to commercial seed growers and seed firms for trial and for purposes of seed increase. The dissemination of stock seed in this manner should enable the seed trade to supply promptly any probable demand for seed of the new variety by 1942.



